



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/044,990 | 01/15/2002 | Satoshi Arakawa | 216449US-8 | 2720 |

22850 7590 11/21/2003

OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

ROCCHEGIANI, RENZO

ART UNIT PAPER NUMBER

2825

DATE MAILED: 11/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/044,990

Applicant(s)

ARAKAWA ET AL.

Examiner

Renzo N. Rocchegiani

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-16 is/are pending in the application.
- 4a) Of the above claim(s) 1-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 12 is rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,026,106 (Suzuki et al.).

Suzuki et al. disclose a process to form an optical device comprising a DFB laser and a modulator wherein the modulator contains aluminum while the DFB laser does not contain aluminum. (col. 7, lines 20-67).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,026,106 (Suzuki et al.) in view of U.S. Patent No. 4,820,655 (Noda et al.).

As stated in paragraph 2, all the limitations of the claim are met except for specifying the step by step process of forming the mesa structures.

Noda et al. teaches a process to form a monolithic semiconductor optical device

Art Unit: 2825

comprising the steps of providing a substrate (item 1, Fig. 4A), sequentially forming an EA modulator and a DFB laser on the substrate (Fig. 4A-F). The process comprises forming a multilayer structure for either the modulator or the laser over the whole substrate (Fig. 4A), etching the structure to uncover a region of the substrate (Fig. 4B), forming a second multilayer structure for either the modulator or the laser (Fig. 4C), whichever has not been formed, and etching to create two mesa structures one being the laser and the other the modulator (Fig. 4E). Furthermore, Noda et al. teaches that the modulator may comprise an aluminum based active region. (col. 4, lines 20-25).

It would have been obvious to one having ordinary skill in the specific art to combine the teachings of Noda et al. to those of Suzuki et al., since Noda et al. teaches that using the method taught in their patent will result in manufacturing the device with good reproducibility and without abnormal growth or deterioration. (col. 1, lines 19-23).

5. Claim 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,026,106 (Suzuki et al.) in view of U.S. Patent No. 4,820,655 (Noda et al.) and in further view of U.S. Patent No. 5,585,957 (Nakao et al.).

As stated in paragraph 4, all the limitations of the claims have been met except for specifying that the etch process is a dry etch process involving bromine and methane-based species.

Nakao et al. teaches a method of forming an optical semiconductor device with mesa formation wherein the multilayer structures are etched via a dry etch process involving methane-based and bromine species. (col. 21, lines 50-60).

Art Unit: 2825

It would have been obvious to one having ordinary skill in the specific art to apply the teachings of Nakao et al., since it has been held to be within the level of ordinary skill of a worker in the art to use conventional materials to perform their known functions in a conventional process. *In re Raner* 134 USPQ 343 (CCPA 1962).

6. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,026,106 (Suzuki et al.) in view of Applicant's disclosure pages 2-3.

As stated in paragraph 2, all the limitations of the claim have been met except for teaching the sandwiching of the structure in Fe-doped InP.

In the background section of the present application the applicant describes what has been admitted to be known in the art in the manufacturing process of optical devices, and in this disclosure applicant admits that it is common practice to sandwich the structure with Fe-doped InP material.

In light of applicant's admission, it would have been obvious to one with ordinary skill in the specific art to use a material such as Fe-doped InP to sandwich the structures, since such a process is common practice.

Response to Arguments

7. Applicant's arguments with respect to claims 12-16 have been considered but are moot in view of the new ground(s) of rejection. Upon an update of the search the examiner has discovered patent No. 6,026,106 that anticipates claim 12 and renders the rest of the claims obvious. Thus a new set of rejection has been presented above.

Art Unit: 2825

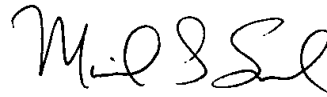
Conclusion

1. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Renzo Rocchegiani whose telephone number until January 6, 2004 is (703) 308-5839 and after January 6, 2004 is (571) 272-1904. The examiner can normally be reached on Monday through Friday from 8:30 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith, until January 6, 2004 can be reached at (703) 308-1323, and after January 6, 2004 can be reached at (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

RNR

November 17, 2003



MATTHEW SMITH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800